1. A cast steel having a martensite matrix structure and comprising, based on weight percent:

a) from about 5.0 - 15% Cr;

b) from about 0.5 - 15% Ni;

c) from about 0.1 - 10% Mo;

d) not more than about 2% Si;

e) from about 0.1 - 2% Mn;

f) from about 0.1 - 2% C;

g) not more than about 1% S;

h) not more than about 1% P;

i) not more than about 5% B;

j) and the balance being substantially Fe.

2. A cast steel as recited in claim 1 having an HRC hardness of between about 40 - 50.

3. A cast steel having a martensite matrix structure and comprising, based on weight percentage

a) from about 8-9% Cr;

b) from about 1 - 2% Ni;

c) from about 0.5 - 0.7% Mo;

d) not more than about 0.75% Si;

e) not more than about 0.75% Mn;

f) from about 0.15 - 0.2% C;

g) not more than about 0.03% S;

h) not more than about 0.04% P;

i) not more than about 0.1% B;

j) and the balance being substantially Fe.

4. A cast steel as recited in claim 3 having an HRC of between about 40 - 50.

5. A cast steel as recited in claim 3 wherein Cr is present in an amount of about 8.76%; Ni is present in an amount of about 1.95%; Si is present in an amount of about 0.67%; Mo is present in an amount of about 0.51%; Mn is present in an amount of about 0.62%; B is present in an amount of about 0.11%; P is present in an amount of about 0.01%; S is present in an amount of about 0.01%; and carbon is present in an amount of about 0.18%.

6. A cast steel as recited in claim 5 wherein said Fe is present in an amount of about 86.5 - 90.3%.

7. A cast steel as recited in claim 3 wherein Cr is present in an amount of about 8.06%; Ni is present in an amount of about 1.27%; Si is present in an amount of about 0.20%; Mo is present in an amount of about 0.51%; Mn is present in an amount of about 0.17%; P is present in an amount of about 0.006%; S is present in an amount of about 0.002%; and C is present in an amount of about 0.18%.

8. A cast steel as recited in claim 3 wherein Cr is present in an amount of about 8.86%; Ni is present in an amount of about 1.26%; Si is present in an amount of about 0.26%; Mo is present in an amount of about 0.51%; Mn is present in an amount of about 0.21%; P is present in an amount of about 0.004%; S is present in an amount of about 0.002%; and C is present in an amount of about 0.17%.

9. A process for forming a cast, martensitic mold alloy, said process comprising:

(1) forming a molten mixture, based upon weight, of the following components:

a) from about 5.0 - 15% Cr;

b) from about 0.5 - 15% Ni;

c) from about 0.1 - 10% Mo;

d) not more than about 2% Si;

e) from about 0.1 - 2% Mn;

f) from about 0.1 - 2% C;

g) not more than about 1% S;

h) not more than about 1% P;

i) not more than about 5% B;

j) and the balance being substantially Fe

(2) allowing the molten mixture to cool to form a fully tempered martensite without further tempering heat treatment.

10. Process as recited in claim 9 wherein said step of forming comprises melting and mixing said components in an inert atmosphere and then pouring said molten mixture through air into an insulated mold.

11. Process as recited in claim 9 wherein said molten mixture is allowed to cool for a period of about 8 hours or more.

12. Process as recited in claim 9 wherein said molten mixture is allowed to cool to about ambient.

13. Process as recited in claim 9 wherein said molten mixture comprises the following components:

a) from about 8 - 9% Cr;

b) from about 1 - 2% Ni;

c) from about 0.5 - 0.7% Mo;

d) not more than about 0.75% Si;

e) not more than about 0.75% Mn;

f) from about 0.15 - 0.2% C;

g) not more than about 0.03% S;

h) not more than about 0.04% P;

i) not more than about 0.1% B;

j) and the balance being substantially iron, said fully tempered martensite having a hardness HRC of about 40 to about 50.

14. Process as recited in claim 13 wherein Cr is present in an amount of about 8.76%; Ni is present in an amount of about 1.95%; Si is present in an amount of about 0.67%; Mo is present in an amount of about 0.51%; Mn is present in an amount of about 0.62%; B is present in an amount of about 0.11%; P is present in an amount of about 0.01%; S is present in an amount of about 0.01%; and C is present in an amount of about 0.18%.

15. Process as recited in claim 14 wherein said Fe is present in an amount of about 86.5 - 90.3%.

16. Process as recited in claim 13 wherein Cr is present in an amount of about 8.06%; Ni is present in an amount of about 1.27%; Si is present in an amount of about 0.20%; Mo is present in an amount of about 0.51%; Mn is present in an amount of about 0.17%; P is present in an amount of about 0.006%; S is present in an amount of about 0.002%; and C is present in an amount of about 0.18%.

17. Process as recited in claim 13 wherein Cr is present in an amount of about 8.86%; Ni is present in an amount of about 1.26%; Si is present in an amount of about 0.26%; Mo is present in an amount of about 0.51%; Mn is present in an amount of about 0.21%; P is present in an amount of about 0.004%; S is present in an amount of about 0.002%; and C is present in an amount of about 0.17%.